

## When higher Modules talk to phonology, they talk to empty nuclei

The purpose of this talk is to show that empty nuclei play a prominent role in the processing of non-phonological information in phonology.

Since Selkirk (1980, 1984) and Nespor & Vogel (1986), the interface between phonology and the other modules of the grammar has been dominated by the idea that phonological processes make only indirect reference to morpho-syntactic information. The incarnation of this idea is the arboreal constituency that phonologists call the Prosodic Hierarchy (e.g. phonological word, phrase, utterance, intonational phrase). In this context, "indirect" means that phonological rules that are sensitive to extra-phonological information make only reference to the prosodic constituency, not to morpho-syntactic structure itself. The prosodic constituency, lying within the phonological module, replicates certain aspects of (most of) the morpho-syntactic structure; it is built by the real interface, the mapping rules, where all important decisions are taken, namely how morpho-syntactic structure is grouped in order to be shipped off to phonology in the coat of prosodic constituency. The crucial (and only) argument (regarding the interface) for the existence of the prosodic constituency is so-called non-isomorphism: the domains relevant to phonological processes are not the same as those that are provided by morpho-syntax. The classical example is "This is [the cat that caught [the rat that stole [the cheese]]]" where the syntactic structure indicated does not match the intonational divisions "[This is the cat] [that caught the rat] [that stole the cheese]". Hence the relevant phonological domains must exist independently: they are created by mapping rules.

I show that non-isomorphism is a mirage created by the unmotivated abandon of boundaries in favour of domains as the relevant interface information. In the example quoted, it is certainly true that there is no node in morpho-syntactic structure that dominates the intonationally relevant chunks; but the intonational structure falls out if the object is looked at with boundaries in mind instead of domains: a new intonational unit begins at every CP.

On this count, thus, the prosodic constituency - which I call the buffer - is redundant: it creates several layers of arboreal structure that only contain information which is available elsewhere. Therefore, I argue that interface theory must do away with the buffer. The translator's office, however, is still needed. Not because of non-isomorphism, but because of modularity. Taking modularity seriously means that morpho-syntax does not even know that there is a phonology on this planet, just as phonology ignores the existence of morpho-syntax. The conception of modules as different ontological spaces is also enforced by an argument that grounds Jackendoff's (1997,2002) parallel model (but seems to be absent from the Prosodic Phonology literature): phonology and morpho-syntax do not speak the same language (of the mind). That is, number, person, quantification, aspect etc. are common to morpho-syntax and semantics but absent from phonology, while occlusion, onset etc. are unknown categories outside of phonology. Therefore, there could not be any communication without translation into the foreign language.

In short, thus, we need a translator's office, but one whose output is not a buffer. The output must be true phonological categories, i.e. which exist in phonology independently of any translating process. This is, then, a DIRECT interface, as opposed to indirect Prosodic Phon.

Up to this point, the argument is theory-unspecific. But its implementation is necessarily theory-specific: every theory has its own vocabulary. Hence what exactly the translator's office ships off depends on the phonological theory used. Therefore, a merit of Direct Interface theory is that unlike in diacritic approaches (like SPE) or in those that use a buffer (which is a form of diacritic), the interface does not look the same when competing phonological theories are used. It is therefore possible to judge phonological theories from their interface-behaviour. I present an implementation of Direct Interface theory into the environment of Government Phonology (CVCV, Lowenstamm 1996,1999, Szigetvári 1999, Scheer 2004), and show that empty nuclei play the central role in the translating process. I then argue that the predictions enforced by the

intrinsic properties of CVCV in regard of the interface are theoretically and empirically relevant and could not be achieved without empty nuclei. Hence empty nuclei are a critical ingredient of phonological theory not only for the sake of domestic phonology, but also because they are the angle stone of the communication with other modules.

The relevant vocabulary used in CVCV are onsets, nuclei, Government and Licensing. It is obvious from observation that higher level information has no bearing on objects below the skeleton, and on those that occur morpheme-internally. That is, for any given boundary, the only thing that can be modified by the interface is the last object of the preceding, and the first object of the following morpheme. In CVCV, the former is necessarily a nucleus, the latter an onset. Onsets, however, are not phonological actors: all lateral relations, i.e. the syllable-defining forces, originate in nuclei. I therefore propose that the translator's office has exactly four outputs: it may issue the orders 1) "final empty Nuclei (FEN) are governed (i.e. may remain phonetically unexpressed)", 2) "the FEN is a good licenser", 3) "the FEN is a good governor", or 4) insert additional syllabic space, i.e. an empty CV unit. All four actions are illustrated with empirical material. One example is the distribution of the English velar nasal, a typical level 1 vs. level 2 event: [ŋ] occurs word-finally and before level 1 suffixes (sing, sing-ing), while [ŋg] is found morpheme-internally and before level 2 suffixes (finger, long-er). Since no interface intervention is possible morpheme-internally, [ŋg] must be the result of pure domestic phonological rule. The analysis, then, says that /g/ needs to be licensed in order to be pronounced. FEN thus do not license in English (cf. sing $\emptyset$ , something that is confirmed by other processes such as dark l, Bill, children [t] vs. Billy [l] where word-final consonants are also weak). Nothing special needs to be said about level 1 suffixes either since the first vowel of the suffix according to purely domestic phonological law governs the FEN of the root, which therefore cannot license the preceding /g/. The same is true for level 2 suffixes, but this time the interface intervenes with order 2): "you, FEN, are a good licenser". An interesting effect of this analysis is the complete absence of serialism, although level 1 - level 2 phenomena have a serial reputation.

Now one could ask why the interface-orders do not come down directly on the last consonant: why should they take the long way via a putative FEN that one cannot hear? The answer is extrasyllabicity or, rather, the way this phenomenon is handled in CVCV (Scheer 2004). One basic observation regarding extrasyllabicity is the fact that final consonants cannot be "selectively" extrasyllabic: they cannot be extrasyllabic in regard of phenomena that concern their own body, but be regularly syllabified when the preceding vowel is concerned. Hence a language where closed syllable shortening occurs only in internal closed syllables but not before word-final consonants will also show coda-effects only on internal codas, while word-final consonants stand aside. Any theory must therefore be able to capture both the consonantal and the vocalic effects of "extrasyllabicity" by one single mechanism. In CVCV, this is Licensing: FEN may or may not be good licensers. The targets of this Licensing are both the preceding word-final consonant and the vowel to its left. Since vowel length depends on Licensing (Scheer 2004), the single parameter "FEN good/ no good licensers" does the same unified job as classical extrasyllabicity. On this analysis, however, interface-orders could not directly target word-final consonants: the "unified extrasyllabicity"-effect would be missed.

If the interface is direct and relies on empty nuclei as proposed, the overall phonological landscape clears up: Government Phonology in general and CVCV in particular have "flattened" phonological structure in the sense that syllabic generalisations which are usually expressed by arboreal structure now are encoded by lateral forces (Government and Licensing). Also, Szigetvári & Scheer (2005) argue that stress is better analysed in a flat environment. Finally, the present proposal does away with prosodic arboreal constituency. Hence there are no trees left in phonology. This result is interesting in regard of an old observation: there is no recursion in phonology. Recursion, however, supposes arboreal structure: something is recursive iff an object is dominated by another object of the same kind. Hence the absence of trees in phonology, i.e. of Merge, explains the absence of recursion. This is also consistent with Chomsky et al. (2002) who argue that Merge is a syntactic privilege, i.e. absent from phonology (and semantics).

## References

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